3 Structure and Format

The 2010 Census TIGER/Line Shapefiles and associated relationship files are offered in a compressed format. One zipped file is available for each layer, with a file extension of .zip. Each zipped shapefile consists of the following five files:

- .shp – the feature geometry
- .shx – the index of the feature geometry
- .dbf – the tabular attribute information
- .prj – the coordinate system information
- .shp.xml – the metadata

Each zipped relationship file consists of the following two files:

- .dbf – the tabular attribute information
- .dbf.xml – the metadata

3.1 Shapefile Vintages

The 2010 Census TIGER/Line Shapefiles are available in 2010 Census and Census 2000 vintages to enable data users to link geography of the appropriate vintage with the data of the same vintage. For example, if the user wanted to create a map of Census 2000 information, then the user would use the Census 2000 vintage shapefiles. The following is an explanation of the vintages available in the TIGER/Line Shapefiles. Table 1 shows the vintages available for each shapefile or relationship file.

3.1.1 2010 Census Geography

2010 Census geography is defined as the latest version of the geographic extent of legally defined geographic areas as reported, generally reflecting the boundaries of governmental units in effect as of January 1, 2010, and statistical area boundaries that have been delineated for the 2010 Census. This vintage enables users to see 2010 boundaries of governmental units and statistical areas and they will match the data from the surveys that use 2010 geography, such as the 2010 Census and the 2010 American Community Survey.

3.1.2 Census 2000 Geography

Census 2000 geography is the geographic extent of legally defined geographic areas or statistical areas in effect on January 1, 2000. This vintage enables users to work with Census 2000 data using boundaries as they existed in 2000. Since 2000, the Census Bureau initiated significant operations to improve the coordinate accuracy of our geographic database - the MAF/TIGER Accuracy Improvement Project or MTAIP. The MTAIP modified the base coordinates of virtually all the features in the database, thus the representation of Census 2000 geography will not match the representation depicted in the Census 2000 TIGER/Line files. The inventory and attributes of the 2000 census geography is, however, unchanged.

Table 1: 2010 Census Shapefile and Relationship

File Availability by Vintage

File Type	Version	
	Census 2000	2010 Census
Shapefiles		
Alaska Native Regional Corporation (state-based)	✓	✓
American Indian Tribal Subdivision (American Indian area-based)	✓	✓
American Indian Tribal Subdivision (nation-based)	✓	✓
American Indian Tribal Subdivision (state-based)	✓	✓
American Indian/Alaska Native/Native Hawaiian Areas (nation-based)	✓	✓
American Indian/Alaska Native/Native Hawaiian Areas (state-based)	✓	✓
Block (county-based)	✓	✓
Block (state-based)	✓	✓
Block Group (county-based)	✓	✓
Block Group (state-based)	✓	✓
Census Tract (county-based)	✓	✓
Census Tract (state-based)	✓	✓
Combined New England City and Town Area (nation-based)		✓
Combined New England City and Town Area (state-based)		✓
Combined Statistical Area (nation-based)		✓
Combined Statistical Area (state-based)		✓
108th Congressional Districts (nation-based)	✓*	
108th Congressional Districts (state-based)	✓*	
111th Congressional Districts (nation-based)		✓*
111th Congressional Districts (state-based)		✓*
Consolidated City (state-based)	✓	✓
County and Equivalent (nation-based)	✓	✓
County and Equivalent (state-based)	✓	✓
County Subdivision (county-based)	✓	✓
County Subdivision (state-based)	✓	✓
Elementary School District (state-based)	✓	✓
Metropolitan Division (nation-based)		✓
Metropolitan Division (state-based)		✓
Metropolitan/Micropolitan Statistical Area (nation-based)		✓
Metropolitan/Micropolitan Statistical Area (state-based)		✓
New England City and Town Area (nation-based)		✓
New England City and Town Area (state-based)		✓

File Type	Version	
	Census 2000	2010 Census
Shapefiles		
New England City and Town Division (nation-based)		✓
New England City and Town Division (state-based)		✓
Place (state-based)	✓	✓
Secondary School District (state-based)	✓	✓
State and Equivalent (nation-based)	✓	✓
State and Equivalent (state-based)	✓	✓
State Legislative District-Lower Chamber (state-based)	✓	✓
State Legislative District-Upper Chamber (state-based)	✓	✓
Subbarrio (county-based)	✓	
Subminor Civil Division (state-based)		✓***
Tribal Block Group (American Indian area-based)		✓
Tribal Block Group (nation-based)		✓
Tribal Census Tract (American Indian area-based)		✓
Tribal Census Tract (nation-based)		✓
Unified School District (state-based)	✓	✓
Urban Growth Area (state-based)	✓	✓
Voting District (county-based)	✓	✓
5-digit ZIP Code Tabulation Areas (nation-based)	✓	✓
5-digit ZIP Code Tabulation Areas (state-based)	✓	✓
All Lines (county-based)		✓*
All Roads (county-based)		✓**
Area Hydrography (county-based)		✓*
Area Landmark (county-based)		✓*
Linear Hydrography (county-based)		✓**
Military Installation (nation-based)		✓
Military Installation (state-based)		✓
Point Landmark (county-based)		✓*
Primary Roads (nation-based)		✓**
Primary and Secondary Roads (state-based)		✓**
Rails (nation-based)		✓**
Topological Faces (Polygons With All Geocodes) (county-based)		✓*

File Type	Version	
	Census 2000	2010 Census
Relationship Files		
Address Range-Feature Name (county-based)		✓*
Address Ranges (county-based)		✓*
Feature Names (county-based)		✓*
Other Identifiers (county-based)		✓*
Topological Faces-Area Landmark (county-based)		✓*
Topological Faces-Area Hydrography (county-based)		✓*
Topological Faces-Military Installation (nation-based)		✓*

*not indicated as '2010 Census' in title of file; no assigned vintage
**not indicated as '2010 Census' in title of file; no assigned vintage / new for this version of the TIGER/Line shapefiles
*** new for this version of the TIGER/Line shapefiles

3.2 Organization of the Files

Geographic entities included in the Census Bureau's tabulations are generally hierarchical. The organizational structure of the 2010 Census TIGER/Line Shapefiles is based on this hierarchical framework. Figures 1 and 2 show the progression of geographic areas from the nation to the block level, as well as the American Indian, Alaska Native, and Native Hawaiian areas.

Shapefiles are released in one of two types of hierarchical coverage—state-based or county-based. Some shapefiles are released in multiple coverages to enable flexibility in downloading files. Descriptions of each coverage type are listed below. Table 2 provides an overview of which file types are available by each hierarchical coverage.

- American Indian Area-based files—each file includes data for one specific American Indian area.
- Nation-based files—each file includes data for the 50 states, the District of Columbia, and Puerto Rico.
- State-based files—each file includes data for one specific state or equivalent.
- County-based files—each file includes data for one specific county or equivalent.

Figure 1. Standard Hierarchy of Census Geographic Entities

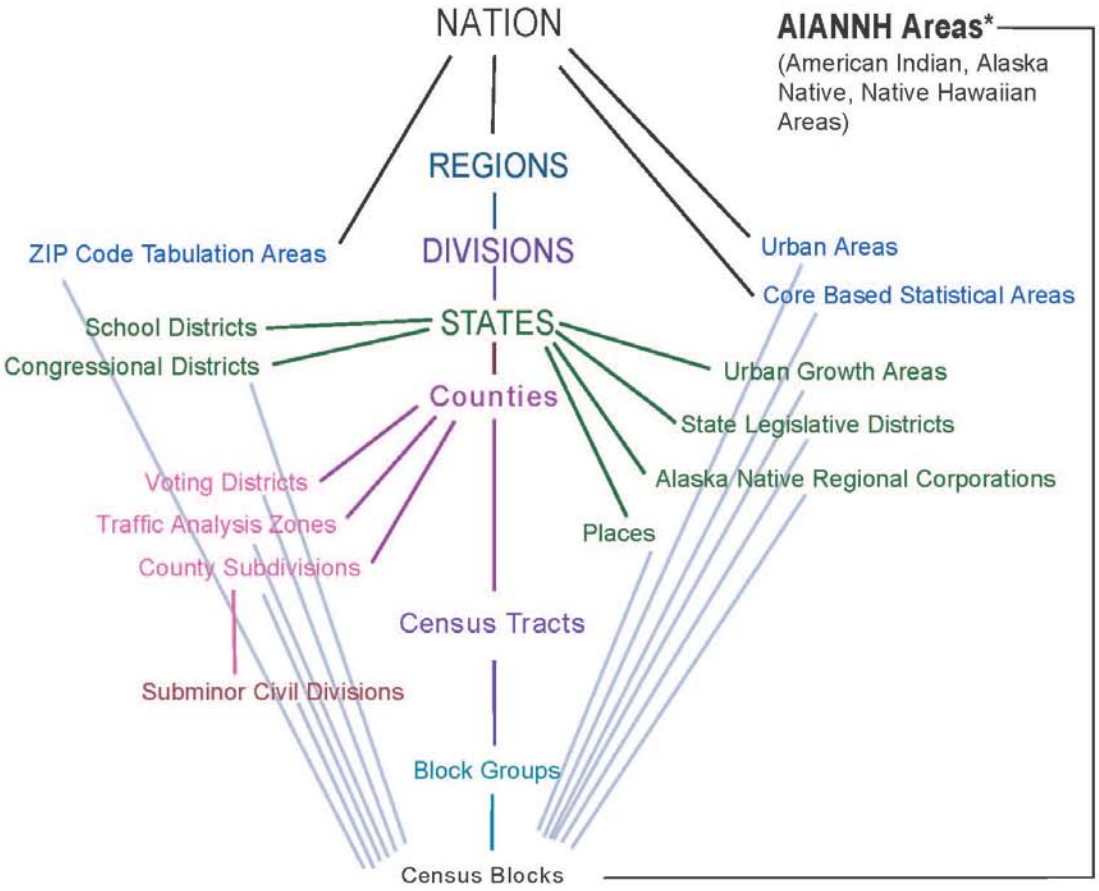

Figure 2. Hierarchy of American Indian, Alaska Native, and Native Hawaiian Areas

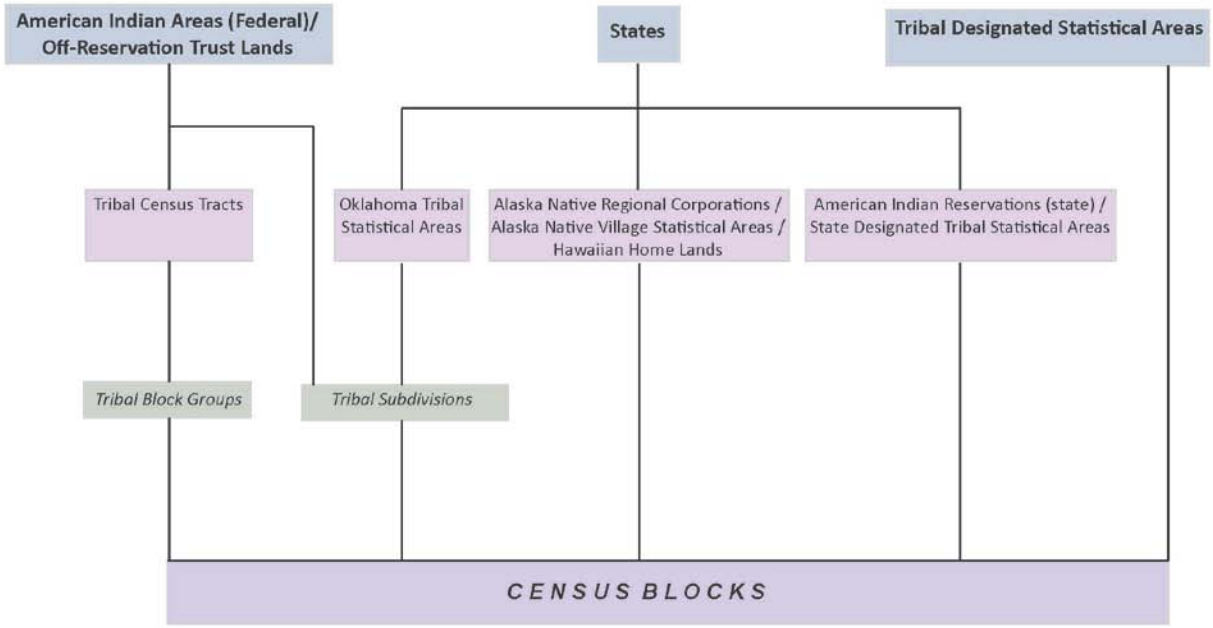

Table 2: 2010 Census Shapefile Layers Availability by Parent Geography

Layer	American Indian Area-Based Files	Nation-Based Files	State-Based Files	County-Based Files
Shapefiles				
Alaska Native Regional Corporation			✓	
American Indian Tribal Subdivision	✓	✓	✓	
American Indian/Alaska Native/Native Hawaiian Areas		✓	✓	
Block			✓	✓
Block Group			✓	✓
Census Tract			✓	✓
Combined New England City and Town Area		✓	✓	
Combined Statistical Area		✓	✓	
108th Congressional Districts		✓	✓	
111th Congressional Districts		✓	✓	
Consolidated City			✓	
County and Equivalent		✓	✓	
County Subdivision			✓	✓
Elementary School District			✓	
Metropolitan Division		✓	✓	
Metropolitan/Micropolitan Statistical Area		✓	✓	
New England City and Town Area		✓	✓	
New England City and Town Division		✓	✓	
Place			✓	
Secondary School District			✓	
State and Equivalent		✓	✓	
State Legislative District-Lower Chamber			✓	
State Legislative District-Upper Chamber			✓	
Subbarrio				✓
Subminor Civil Division			✓	
Tribal Block Group	✓	✓		
Tribal Census Tract	✓	✓		
Unified School District			✓	
Urban Growth Area			✓	
Voting District				✓
5-digit ZIP Code Tabulation Area		✓	✓	
All Lines				✓
All Roads				✓
Area Hydrography				✓
Area Landmark				✓
Linear Hydrography				✓
Military Installation		✓	✓	
Point Landmark				✓

Layer	American Indian Area-Based Files	Nation-Based Files	State-Based Files	County-Based Files
Primary Roads		✓		
Primary and Secondary Roads			✓	
Rails		✓		
Topological Faces (Polygons With All Geocodes)				✓
Relationship Files				
Address Range-Feature Name				✓
Address Ranges				✓
Feature Names				✓
Other Identifiers				✓
Topological Faces-Area Landmark				✓
Topological Faces-Area Hydrography				✓
Topological Faces-Military Installations		✓		

3.3 File Naming Conventions

The name of each file is:

tl_2010_<*extent*>_<*layer*>.<*ext*>

Where:

tl = TIGER/Line

2010 = the version of the files

<*extent*> = parent geography entity ID code (variable length of two to five characters)
The entity ID code identifies the geographic extent by specific entity for which the file contains data. It is of variable length depending on the type of file:

American Indian area-based:	4-digit numeric American Indian area Census code
Nation-based:	2-character abbreviation – "us"
State-based:	2-digit numeric state FIPS code
County-based:	5-digit numeric county FIPS code

<layer> = layer tag of variable length
The layer tag specifies the type of geography or feature the file contains. If "00" appears at the end of the layer tag, the file contains Census 2000 geography. If "10" appears, the file contains 2010 Census geography.

<*ext*> = the file extension

Examples:

American Indian Area- based shapefile: Tribal Block Group shapefile for Acoma Pueblo and Off-Reservation Trust Land
File Name: tl_2010_0010_tbg10.shp

Nation- based shapefile: County and Equivalent shapefile
File Name: tl_2010_us_county10.shp

State- based shapefile: State and Equivalent shapefile for Maryland
File Name: tl_2010_24_state10.shp

County- based shapefile: All Lines shapefile for Cayuga County, New York
File Name: tl_2010_36011_edges.shp

3.4 Datum (GCS NAD 83)

Each shapefile contains a .prj file that contains the GIS industry standard well-known text (WKT) format to describe the coordinate system/projection/datum information for each shapefile. This enables users to easily import the shapefiles into their local coordinate system. All Census Bureau generated shapefiles are in Global Coordinate System North American Datum of 1983 (GCS NAD83). Each .prj file contains the following:

GEOGCS["GCS_North_American_1983",DATUM["D_North_American_1983",SPHEROID["GRS_1980",6378137, 298.257222101]],PRIMEM["Greenwich",0],UNIT["Degree",0.017453292519943295]]

3.5 Metadata

Metadata are an organized data file used to capture the basic descriptive characteristics about data. For example, metadata will describe the quality, purpose, spatial extent, and history of a particular dataset.

A metadata file in XML (Extensible Markup Language) format is provided along with each shapefile and relationship file. Metadata files associated with shapefiles have the extension .shp.xml, and those associated with relationship files have the extension .dbf.xml. The metadata files comply with Federal Geographic Data Committee (FGDC) standards and can be read in any text editor. Please note that in order to see all the metadata element values, the 'FGDC Classic ' stylesheet must be specified when using ESRI's ArcCatalog.

The TIGER/Line Shapefiles metadata contain an entity and attribute information section. The entity and attribute information provide a detailed description of the TIGER/Line Shapefiles and relationship files that include publication date, contact information, and all of the possible valid values for an attribute and each value's meaning. There will be one entity section for each shapefile and relationship file. Users should refer to the metadata files for extensive documentation about the contents of the shapefiles and relationship files.

In addition, the All Lines Shapefile also contains a Spatial Metadata Identifier (SMID), which identifies the source of the coordinates for each edge and provides the link between the TIGER/Line Shapefiles and the source and horizontal spatial accuracy information. Refer to the metadata for each county or equivalent entity for information on the source for each edge and the horizontal spatial accuracy, where known. Please note that the horizontal spatial accuracy, where reported, refers only to those edges identified as matched to the source with that accuracy. It is not the spatial accuracy of the TIGER/Line Shapefile as a whole. For more information regarding the *All Lines Shapefile* please refer to Section 2.5, Spatial Accuracy of Linear Features or Section 5.11, Linear Features.

TIGER/Line Shapefiles are a product of the U.S. Census Bureau and as such contain metadata that comply with two standards: the Census Bureau Geospatial Product Metadata Standard (GPMS), and the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (CSDGM). The Census Bureau created the Geospatial Product Metadata Standard (GPMS) which includes metadata elements from the FGDC CSDGM and the International Organization for Standardization (ISO) metadata standard: ISO 19115.